

WHAT IS CLAIMED IS:

1. A driver circuit comprising:
 - an operational amplifier having an input and an output coupled by a feedback element;
 - a voltage level shifter for generating a voltage drop from the operational amplifier output to the operational amplifier input, comprising:
 - a current source transistor for setting a current controlling the voltage drop across the feedback element; and
 - a chopper circuit for shifting flicker noise generated by the current source transistor to a higher frequency spectrum.
2. The driver circuit of Claim 1, further comprising a cascode transistor coupling the chopper circuit and the input of the operational amplifier for attenuating non-settled voltage at the input of the operational amplifier.
3. The driver circuit of Claim 1, wherein the chopper circuit couples the input of the operational amplifier and the current source transistor.

4. The driver circuit of Claim 1, wherein the operational amplifier comprises a differential operational amplifier having another input and another output coupled by another feedback element, the voltage level shifter generating a voltage drop from the another output to the another input and comprising:

another current source transistor for setting a current controlling the voltage drop across the another feedback element, flicker noise generated by the another current source transistor shifted to a higher frequency spectrum by the chopper circuit.

5. The driver circuit of Claim 4, further comprising another cascode transistor coupling the chopper circuit and the another input of the operational amplifier.

6. A method of voltage level shifting at an input of an operational amplifier comprising:
 - generating a voltage drop across a feedback element coupling an input and an output of an operational amplifier circuit by setting a current through a current source transistor; and
 - chopping a signal through the current source transistor to shift flicker noise generated by the current source transistor to a higher frequency spectrum with a chopper circuit.
7. The method of Claim 6, further comprising attenuating the non-settled voltage at the input of the operational amplifier with a cascode transistor coupling the chopper circuit and the input of the operational amplifier.
8. The method of Claim 6, wherein chopping the signal through the current source comprises coupling an input of the chopping circuitry to the feedback element and an output of the chopping circuitry to the current source transistor.
9. The method of Claim 6, wherein the operational amplifier comprises a differential amplifier and generating a voltage drop across a feedback element comprises generating a voltage drop across a selected one of a feedback element coupling an inverting input and a non-inverting output of the operational amplifier and another feedback element coupling a non-inverting input and an inverting output of the differential amplifier.

10. The method of Claim 6, further comprising:

generating a voltage drop across a second feedback element coupling a second input and a second output of the operational amplifier circuit by setting a current through a second current source transistor; and

chopping a signal through the second current source transistor to shift flicker noise generated by the second current source transistor to a higher frequency spectrum with a chopper circuit.

11. A digital to analog converter comprising:
 - a data conversion element including a current element and switches for selectively switching current through the current element to first and second signal lines in response to a data bit and a complementary data bit;
 - an operational amplifier, first and second summing nodes at the operational amplifier inputs coupled to the first and second signal lines and to first and second outputs of the operational amplifier through first and second feedback elements; and
 - a level shifter for controlling a voltage on the first and second signal lines, comprising:
 - first and second current source transistors for respectively pulling current from the first and second signal lines; and
 - chopper circuitry coupled to the first and second current source transistors for shifting flicker noise to a higher frequency spectrum.

12. The digital to analog converter of Claim 11, wherein the operational amplifier has an output common mode voltage higher than the input common mode voltage and the first and second current source transistors produce a voltage drop across the first and second feedback elements for protecting the first and second inputs of the operational amplifier.

13. The digital to analog converter of Claim 12, wherein the operational amplifier includes low voltage input transistors at the first and second inputs.

14. The digital to analog converter of Claim 12, wherein the current element of the data conversion element comprises at least one low voltage transistor.

15. The digital to analog converter of Claim 14, wherein the at least one low voltage transistor comprises a p-type metal oxide semiconductor transistor.

16. The digital to analog converter of Claim 11, wherein the first and second current source transistors comprise n-type metal oxide semiconductor transistors.

17. The digital to analog converter of Claim 11, further comprising an input for receiving a stream of digital audio data.

18. The digital to analog converter of Claim 11, further comprising first and second cascode transistors for coupling the chopping circuitry with the first and second signal lines for attenuating the non-settled voltage at the input of the opamp.

19. The digital to analog converter of Claim 11, further comprising circuitry for generating at least one chopping control signal from a high frequency clock signal.

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20. The digital to analog converter of Claim 11, wherein the digital to analog converter forms a portion of a digital audio processing system.